What is claimed and desired to be secured by letters of U.S. patent is:

1. An electronic game device comprising

[a.a housing for the device,]

[b] a. means for generating a plurality of [codes hereinafter refereed to as] operating codes[,];

[c]b. a plurality of entry control means[,];

[d]c. a plurality of routing means defining a respective plurality of playing positions [on the surface of said housing], each of said routing means being actuable by said entry control means to route said operating codes within the device[,];

[e]d. means to generate a plurality of [codes, hereinafter refereed to as] color codes, from said plurality of operating codes[,];

[f]e. a plurality of multi-color light emitting means[,];

[g]f. means to route said color codes to said light emitting means in accordance with the determination of said routing means[,] ; and

[h]g. means to decode said plurality of color codes and activate said plurality of multi-color light emitting means[,

i. means for varying the level of difficulty of any particular game; and

j. sensorially perceptible indicating means responsive to said entry control means for generating a first sensorially perceptible indication corresponding to each activation of the

entry control means, a plurality of sensorially perceptible and distinct indications each of which is corresponding to each of a plurality of predetermined colors being displayed at a multi-color light emitting means and a sensorially perceptible indication corresponding to the successful completion of a game].

2. An electronic game device as recited in Claim 1 further comprising means to flash said multi-color light emitting means.

3. An electronic game device as recited in Claim 1 wherein said entry control means and multi-color light emitting means include a plurality of multi-color lighted switches.

4. An electronic game device as recited in Claim 1 wherein said means to generate a plurality of color codes includes means to implement a plurality of logic boolean functions.

5. An electronic game device as recited in Claim 1 wherein said operating codes and color codes are binary.

6. An electronic game device as recited in Claim 1 wherein each of said plurality of light emitting means is associated with each of said playing positions.

7. An electronic game device as recited in Claim 1 wherein said means to vary the level of difficulty of any particular game includes means for changing the apparent positions of said entry control means, the apparent positions of said multi-color light emitting means or both.

8. An electronic game device as recited in Claim 1 wherein each of said plurality of color codes corresponds to either each of a plurality of predetermined colors or to a dark indication.

9. An electronic game device as recited in Claim 1 further comprising means to provide a plurality of games.

10. An electronic game device as recited in Claim 9 wherein said means to provide a plurality of games includes a microprocessor which generates sets of random operating codes for each new game.

11. An electronic game device as recited in Claim 1 wherein each of said plurality of entry control means includes a key pad switch.

12. An electronic game device as recited in Claim 1 wherein said sensorially perceptible indications are aural.

13. An electronic game device as recited in Claim 12 wherein at least one of said aural outputs comprises a combination of successive tones of different frequencies.

14. An electronic game device as recited in Claim 1 further comprising means to conserve electrical energy.

15. An electronic game device as recited in Claim [1] <u>48</u> wherein the shape of said housing [can be] <u>is</u> [of any] <u>a</u> three dimensional geometric configuration [and wherein said plurality of playing positions are mapped on the surface of said geometric configuration].

16. An electronic game device as recited in Claim 1 further comprising mode means for controlling said electronic game device to operate in a predetermined number of different levels of difficulty, said controlling means comprising manually operable means for selecting each of said predetermined number of different

operating difficulty levels, said difficulty levels include changing the apparent positions of said entry control means and/or changing the apparent positions of said multi-color light emitting means.

17. An electronic game device as recited in Claim 1 including a microprocessor which comprises:

a. programming means to control the progress of the game[,];

b. programming means to generate said sets of operating codes[,];

c. programming means to monitor the actuation of said entry control means[,];

d. programming means to simulate the operation of said routing means to route said operating codes within the device[,];

e. programming means to compute said color codes from said operating codes by executing a plurality of predetermined boolean functions[,]; and

f. programming means to randomly map the actual positions of said entry control means into a respective plurality of apparent entry control means in order to vary the difficulty of the game [,

g. programming means to randomly map the actual positions of said multi-color light emitting means into a respective plurality of apparent multi-color light emitting means in order to further vary the difficulty of the game,

h. programming means to address each of said multi-color light emitting means to automatically route each of said color codes to its respective multi-color light emitting means in accordance with the determination of said routing means,

i. programming means to control the flashing of said multi-color light emitting means, and

j. programming means to generate a sequence of audio ones to produce said sensorially perceptible indications].

18. An electronic game device as recited in Claim 17 further comprising controlling means for terminating [the] a current game and initiating a new game, said controlling means comprising manually operable means to cause said device to reset its memory and generate a new set of operating codes.

19. An electronic game device as recited in Claim 17 wherein said sensorially perceptible indications are synchronized with said multi-color light emitting means.

20. An electronic game device as recited in claim 17 further comprising addressing means to sequentially activate said multi-color light emitting means, for a predetermined time duration and in accordance with a predetermined activation sequence, in response to each activation of said entry control means.

21. An electronic game device as recited in claim 17 wherein said programming means provide the routing functions of a plurality of routing means each of which is depicted as a two-dimensional geometric [square] shape having four edges and comprises binary

switching means and [further comprises eight (8) ports (]four input ports and four output ports[)] which are depicted to be located at the four (4) edges of the corresponding geometric [square] shape such that one input port and one output port are located at each edge of said [square] geometric shape to provide eight (8) possible internal routes within the geometric square as follows:

a. if said binary switching means is set to "1", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output at the top edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(iii) the input port at the right edge of the [square] geometric shape connects to the output port at the bottom edge of the [square] geometric shape,

(iv) the input port at the top edge of the [square] geometric shape connects to the output port at the left edge of the [square] geometric shape, or

b. if said binary switching means is set to "0", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] geometric shape connects to the output port at the top edge of the square,

(iii) the input port at the right edge of the [square] geometric shape connects to the output port at the left edge of the [square] geometric shape,

(iv) the input port at the top edge of the [square] geometric shape connects to the output port at the bottom edge of the [square] geometric shape.

22. An electronic game device as recited in claim 1 wherein each of said plurality of routing means is depicted as a two-dimensional geometric [square] shape having four edges and comprises binary switching means and [further comprises eight (8) ports (]four input ports and four output ports[)] which are depicted to be located at the four (4) edges of the corresponding geometric [square] shape such that one input port and one output port are located at each edge of said [square] geometric shape to provide eight (8) possible internal routes within the geometric [square] shape as follows:

a. if said binary switching means is set to "1", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output port at the top edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(iii) the input port at the right edge of the [square] geometric shape connects to the output port at the bottom edge of the [square] geometric shape, and

(iv) the input port at the top edge of the [square] connects to the input port at the left edge of the [square] geometric shape, or

b. if said binary switching means is set to "0", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] connects to the output port at the top edge of the [square] geometric shape,

(iii) the input port at the right edge of the [square] geometric shape connects to the output port at the left edge of the [square] geometric shape, and

(iv) the input port at the top edge of the [square] geometric shape connects to the output port at the bottom edge of the [square] geometric shape.

Sub cc1 Sub A

23. An electronic game device comprising:

a. a housing for the device[,];

b. means for generating a plurality of [codes, hereinafter referred to as] operating codes[,];

c. a plurality of entry control means[,];

d. a plurality of routing means defining a respective plurality of playing positions on the surface of said

housing, each of said routing means being actuable by said entry control means to route said operating codes within the device[,];

e. means to pictorially represent a plurality of images[, wherein each of said plurality of playing positions is indicated to provide] at a plurality of dispositions, each of said display positions [is used to indicate] being capable of indicating any of said plurality of images[,];

f. means to generate a plurality of [codes, hereinafter referred to as] display codes[,] from said plurality of operating codes[,];

g. means to route said display codes to said display positions in accordance with the determination of said routing means[,]; and

h. means to activate each of said plurality of display positions to provide a pictorial representation of the received display code[,

i. means for varying the level of difficulty of any particular game, and

j. sensorially perceptible indicating means responsive to said entry control means for generating a first sensorially perceptible indication corresponding to each activation of entry control means, a plurality of sensorially perceptible indications each of which is different from said first sensorially perceptible indication and corresponding to each of said plurality of images being displayed at all display positions, and a sensorially

perceptible indication corresponding to the successful completion of a game].

24. An electronic game device as recited in Claim 23 further comprising means to flash said display positions.

25. An electronic game device as recited in Claim 23 wherein said means to generate a plurality of display codes includes means to implement a plurality of logic boolean functions. completion of a game.

26. An electronic game device as recited in Claim 23 where said operating codes and display codes are binary.

27. An electronic game device as recited in Claim 23 wherein said means to vary the level of difficulty of any particular game includes means for changing the apparent positions of said entry control means, the apparent positions of said display positions or both.

28. An electronic game device as recited in Claim 23 wherein each of said plurality of display codes corresponds to either each of said plurality of predetermined images or to a blank display.

29. An electronic game device as recited in Claim 23 further comprising means to provide a plurality of games.

30. An electronic game device as recited in Claim 29 wherein said means to provide a plurality of games includes a microprocessor which generates sets of random operating codes for each new game.

31. An electronic game device as recited in Claim 23 wherein each of said plurality of entry control means includes a key pad switch.

32. An electronic game device as recited in Claim 23 wherein said sensorially perceptible indications are aural.

33. An electronic game device as recited in Claim 32 wherein at least one of said aural outputs comprises a combination of successive tones of different frequencies.

34. An electronic game device as recited in Claim 23 further comprising mode means for controlling said electronic game device to operate in a predetermined number of different levels of difficulty, said controlling means comprising manually-operable means for selecting each of said predetermined number of different operating difficulty levels.

35. An electronic game device as recited in Claim 23 including a microprocessor which comprises:

a. programming means to control the progress of the game[,];

b. programming means to generate said sets of operating codes[,]

c. programming means to monitor the actuation of said entry control means[,];

d. programming means to simulate the operation of said routing means to route said operating codes within the device[,];

e. programming means to compute said display codes from said operating codes by executing a plurality of predetermined boolean functions[,];

[f. programming means to randomly map the actual positions of said entry control means into a respective plurality of apparent entry control means in order to vary the difficulty of the game,

g. programming means to randomly map the actual positions of said display positions into a respective plurality of apparent display positions in order to further vary the difficulty of the game,

h]f .programming means to generate a plurality of graphic symbols, each of said graphic symbols corresponds to each of said plurality of images[,]; and

[i]g. programming means to address each of said plurality of display positions to automatically route each of said display codes to its respective display positions, in accordance with the determination of said routing means, to provide said pictorial displays[,

j. programming means to control the flashing of said display positions, and

k. programming means to generate a sequence of audio t ones to produce said sensorially perceptible indications].

36. An electronic game device as recited in Claim 35 further comprising controlling means for terminating [the] a current game and initiating means for terminating the current game and initiating a new game, said controlling means comprising manually operable means to cause said device to reset its memory and generate a new set of operating codes.

37. An electronic game device as recited in claim 35 further comprising means for producing video signals, wherein each of said plurality of entry control means includes a key pad switch and wherein said plurality of display positions are provided on a video monitor.

38. An electronic game device as recited in claim 35 wherein said plurality of images include a geometric shape depicted in various colors.

39. An electronic game device as recited in claim 35 wherein said means for pictorially representing said plurality of images comprises an LCD display.

40. An electronic game device as recited in claim 35 wherein said means for pictorially representing said plurality of images comprises an LED display.

41. An electronic game device as recited in claim 35 wherein said sensorially perceptible indications are synchronized with said pictorially display means.

Sub B2

42. An electronic game device as recited in claim 35 wherein said programming means provide the routing functions of a plurality of routing means each of which is depicted as a two-dimensional

geometric [square] shape having four edges and comprises binary switching means and [further comprises eight (8) ports (]four input ports and four output ports[)] which are depicted to be located at the four (4) edges of the corresponding geometric [square] shape such that one input port and one output port are located at each edge of said [square] geometric shape to provide eight (8) possible internal routes within the geometric [square] shape as follows:

a.if said binary switching means is set to "1", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output port at the top edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(iii) the input port at the right edge of the [square] geometric shape connects to the output port at the bottom edge of the [square] geometric shape, and

(iv) the input port at the top edge of the [square] geometric shape connects to the input port at the left edge of the [square] geometric shape, or

b. if said binary switching means is set to "0", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] geometric shape connects to the output port at the top edge of the [square] geometric shape,

(iii) the input port at the right edge of the [square] geometric shape connects to the output port at the left edge of the [square] geometric shape, and

(iv) the input port at the top edge of the [square] geometric shape connects to the output port at the bottom edge of the [square] geometric shape.

43. An electronic game device as recited in Claim 23 wherein each of said plurality of routing means is depicted as a two-dimensional geometric [square] shape having four edges and comprises binary switching means and [further comprises eight (8) ports ()four input ports and four output ports[)] which are depicted to be located at the four (4) edges of the corresponding geometric [square] shape such that one input port and one output port are located at each edge of said [square] geometric shape to provide eight (8) possible internal routes within the geometric [square] shape as follows:

a. if said binary switching means is set to "1", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output port at the top edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(iii)the input port at the right dge of the [square] geometric shape connects to the output port at the bottom edge of the [square] geometric shape, and

(iv) the input port at the top edge of the [square] geometric shape connects to the input port at the left edge of the [square] geometric shape, or

b. if said binary switching means is set to "0", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] connects to the output port at the top edge of the [square] geometric shape,

(iii) the input port at the right edge of the [square] geometric shape connects to the output port at the left edge of the [square] geometric shape, and

(iv) the input port at the top edge of the [square] geometric square connects to the output port at the bottom edge of the [square] geometric shape.

44. An electronic game device comprising:

a. a housing for the device[,];

b. means for generating 2N [codes hereinafter referred to as] operating codes wherein N represents an integer and N is greater than 1[,];

c. N^2 entry control means[,];

d. N^2 routing means defining a respective N^2 playing positions on the surface of said housing, each of said routing means being actuable by said entry control means to route said operating codes within the device[,]; _;_

e. means to generate 2N codes, hereinafter referred to as color codes, from said operating codes, each of N of said color codes correspond[s]_ing_ to each of N predetermined colors, the remaining N color codes correspond to a dark display[,]; _;_

f. N^2 multi-color light emitting means, each of said light emitting means [is] _being_ associated with each of said N^2 playing positions[,]; _;_

g. means to route said color codes to said light-emitting means in accordance with the determination of said routing means[,]; _;_ and

h. means to decode said color codes and activate said multi-color light emitting means[,

i. means for varying the level of difficulty of any particular game, and

j. sensorially perceptible indicating means responsive to said entry control means for generating a first sensorially perceptible indication corresponding to each activation of the entry control means, N sensorially perceptible and distinct indications each of which corresponds to each of said N predetermined colors being displayed at all N^2 multi-color light emitting means and a sensorially perceptible indication corresponding to the successful completion of a game].

45. An electronic game device as recited in Claim 44 wherein each of said N^2 routing means is depicted as a geometric square and comprises binary switching means and further comprises [eight (8) ports (]four input ports and four output ports[)] which are depicted to be located at the four (4) edges of the corresponding geometric [square] shape having four edges such that one input port and one output port are located at each edge of said [square] geometric shape to provide eight (8) possible internal routes within the geometric [square] shape as follows:

a. if said binary switching means is set to "1", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output port at the top edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(iii)the input port at the right edge of the [square] geometric shape connects to the output port at the bottom edge of the [square] geometric shape, and

(iv) the input port at the top edge of the [square] geometric shape connects to the output port at the left edge of the [square] geometric shape, or

b. if said binary switching means is set to "0", then:

(i) the input port at the bottom edge of the [square] geometric shape connects to the output port at the right edge of the [square] geometric shape,

(ii) the input port at the left edge of the [square] geometric shape connects to the output port at the top edge of the [square] geometric shape,

(iii) the input port at the right edge of the [square] geometric shape connects to the output port at the left edge of the [square] geometric shape, and

(iv) the input port at the top edge of the [square] geometric shape connects to the output port at the bottom edge of the [square] geometric shape.

46. A method of defining and solving a logic problem in an electronic logic game comprising the steps of:

a. matching a plurality of predetermined objects placed at the left and bottom edges of a [square with identical] two dimensional geometric shape having four edges with objects placed at its top and right edges[,];

b. using a plurality of playing pieces defined as routing squares and activated by binary switches to determine the internal routes within the [square] geometric shape which interconnect all pairs of objects that belong to a predetermined subset of all possible pairs of said plurality of predetermined objects,

c. designating a color or an image to each of said predetermined subsets[,];

d. causing the color or image associated with each subset to be pictorially indicated at display locations associated with said plurality of playing pieces, as determined by said routing squares and in accordance with the positions of said binary switches[,];

e. observing said displays for various combinations of binary switches whereby a combination associated with one subset may be discovered resulting in the same color or a subset of said plurality of images being pictorially indicated at all display positions[,]; and

f. repeating the aforestated steps until all the combinations associated with all predetermined colors or subsets of said plurality of images have been discovered.

47. An electronic game device as recited in Claim 1 further comprising means for varying the level of difficulty of any particular game.

48. An electronic game device as recited in claim 1 further comprising a housing for the device, said playing positions being mapped on an outer surface of said housing.

49. An electronic game device as recited in Claim 1 further comprising sensorially perceptible indicating means responsive to said entry control means for generating a first sensorially perceptible indication corresponding to activations of the entry control means and a plurality of sensorially perceptible and distinct indications each of which corresponds to at least one of: (a) each of a plurality of predetermined colors being displayed at

all multi-color light-emitting means and (b) a sensorially perceptible indication corresponding to the successful completion of a game.

50. An electronic game device as recited in Claim 17 further comprising at least one of the following:

a. programming means to randomly map the actual positions of said entry control means into a respective plurality of apparent entry control means in order to vary the difficulty of the game, and

b. programming means to randomly map the actual positions of said multi-color light-emitting means into a respective plurality of apparent multi-color light-emitting means in order to further vary the difficulty of the game.

51. An electronic game device as recited in Claim 17 further comprising programming means to flash said multi-color light-emitting means.

52. An electronic game device as recited in Claim 17 further comprising programming means to generate a sequence of audio tones to produce a plurality of perceptible indications.

53. An electronic game device as recited in Claim 23 further comprising means for varying the level of difficulty of any particular game.

54. An electronic game device as recited in Claim 23 further comprising sensorially perceptible indicating means responsive to said entry control means for generating a first sensorially perceptible indication corresponding to activations of the entry

control means and a plurality of sensorially perceptible and distinct indications each of which corresponds to at least one of: (a) each or a subset of a plurality of predetermined images being displayed at all display positions and (b) a sensorially perceptible indication corresponding to the successful completion of a game.

55. An electronic game device as recited in Claim 35 further comprising at least one of the following:

a.programming means to randomly map the actual positions of said entry control means into a respective plurality of apparent entry control means in order to vary the difficulty of the game, and

b.programming means to randomly map the actual positions of said display positions into a respective plurality of apparent display positions in order to further vary the difficulty of the game.

56. An electronic game device as recited in Claim 35 further comprising programming means to flash said display positions.

57. An electronic game device as recited in Claim 35 further comprising programming means to generate a sequence of audio tones to produce a plurality of perceptible indications.

58. An electronic game device as recited in Claim 44 further comprising means for varying the level of difficulty of any particular game.

59. An electronic game device as recited in Claim 44 further comprising sensorially perceptible indicating means responsive to said entry control means for generating a first sensorially perceptible indication corresponding to activations of the entry

control means and a plurality of sensorially perceptible and distinct indications each of which corresponds to at least one of: (a) each of a plurality of predetermined colors being displayed at all multi-color light-emitting means, and (b) a sensorially perceptible indication corresponding to the successful completion of a game.

60. An electronic game device as recited in Claim 23 wherein each of said plurality of routing means is depicted as a two dimensional geometric shape having four edges and comprises binary switching means and further comprises four input ports and four output ports which are depicted to be located at the four (4) edges of the corresponding geometric shape such that one input port and one output port are located at each edge of said geometric shape to provide eight (8) possible internal routes within the geometric shape as follows:

a. if said binary switching means is set to "1", then:

(i) the input port at the bottom edge of the geometric shape connects to the output port at the top edge of the geometric shape,

(ii) the input port at the left edge of the geometric shape connects to the output port at the right edge of the geometric shape,

(iii) the input port at the right edge of the geometric shape connects to the output port at the bottom edge of the geometric shape, and

(iv) the input port at the top edge of the geometric shape connects to the output port at the left edge of the geometric shape or

b. if said binary switching means is set to "0", then:

(i) the input port at the bottom edge of the geometric shape connects to the output port at the right edge of the geometric shape,

(ii) the input port at the left edge of the geometric shape connects to the output port at the top edge of the geometric shape,

(iii) the input port at the right edge of the geometric shape connects to the output port at the left edge of the geometric shape, and

(iv) the input port at the top edge of the geometric shape connects to the output port at the bottom edge of the geometric shape.

61. An electronic game device as recited in Claim 41 wherein said programming means provide the routing functions of a plurality of routing means each of which is depicted as a two dimensional geometric shape having four edges and comprises binary switching means and further comprises four input ports and four output ports which are depicted to be located at the four (4) edges of the corresponding geometric shape such that one input port and one output port are located at each edge of said geometric shape to provide eight (8) possible internal routes within the geometric shape as follows:

a. if said binary switching means is set to "1", then:

(i) the input port at the bottom edge of the geometric shape connects to the output port at the top edge of the geometric shape,

(ii) the input port at the left edge of the geometric shape connects to the output port at the right edge of the geometric shape,

(iii) the input port at the right edge of the geometric shape connects to the output port at the bottom edge of the geometric shape, and

(iv) the input port at the top edge of the geometric shape connects to the output port at the left edge of the geometric shape, or

b. if said binary switching means is set to "0", then:

(i) the input port at the bottom edge of the geometric shape connects to the output port at the right edge of the geometric shape,

(ii) the input port at the left edge of the geometric shape connects to the output port at the top edge of the geometric shape,

(iii) the input port at the right edge of the geometric shape connects to the output port at the left edge of the geometric shape, and

(iv) the input port at the top edge of the geometric shape connects to the output port at the bottom edge of the geometric shape.

62. An electronic game device as recited in Claim 51 wherein each of said N^2 routing means is depicted as a two dimensional geometric shape having four edges and comprises binary switching means and further comprises four input ports and four output ports which are depicted to be located at the four (4) edges of the corresponding geometric shape such that one input port and one output port are located at each edge of said geometric shape to provide eight (8) possible internal routes within the geometric shape as follows:

a. if said binary switching means is set to "1", then:

(i) the input port at the bottom edge of the geometric shape connects to the output port at the top edge of the geometric shape,

(ii) the input port at the left edge of the geometric shape connects to the output port at the right edge of the geometric shape,

(iii)the input port at the right edge of the geometric shape connects to the output port at the bottom edge of the geometric shape, and

iv) the input port at the top edge of the geometric shape connects to the output port at the left edge of the geometric shape, or

b. if said binary switching means is set to "0", then:

(i) the input port at the bottom edge of the geometric shape connects to the output port at the right edge of the geometric shape,

(ii) the input port at the left edge of the geometric shape connects to the output port at the top edge of the geometric shape,

(iii)the input port at the right edge of the geometric shape connects to the output port at the left edge of the geometric shape, and

(iv) the input port at the top edge of the geometric shape connects to the output port at the bottom edge of the geometric shape.